1996

Multiple perspective tasking as a managerial skill

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MULTIPLE PERSPECTIVE TAKING AS A MANAGERIAL SKILL

A Thesis

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

in

Psychology: Industrial/Organizational

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ABSTRACT

This study explored the construct of multiple perspective taking as it applies to individuals working in an organization. The central theoretical argument asserted is that generative activity of multiple perspective taking combined with the critical thinking cognitive process will be a powerful tool for organizational leaders working in very fluid environment.

The primary purpose of the study was to begin to isolate the construct of multiple perspective taking and develop a short self-report instrument which could assess the construct. A fifteen item self report instrument, the MPT-1, was developed with an alpha coefficient of .86. A principal components analysis of the MPT-1 revealed one major factor accounting for 36.6% of the variance and a second factor accounting for an additional 15.5% of the variance. The two factors represent the multiple perspective taking construct as defined in this research.

Additional analyses explored the relationship of multiple perspective taking to critical thinking and to two of the Big Five personality constructs - conscientiousness and openness to experience.

Significant correlations were found between the MPT-1 and critical thinking, and conscientiousness.

Among several demographic variables, the only significant group differences on the MPT-1 were found between those participants who had managerial experience and those who did not. Those with managerial experience scored significantly higher.

ACKNOWLEDGMENTS

No project like this is completed without the help of many people. I thank Ken Shultz and Janelle Gilbert for their help in honing some of the ideas present in this research and for teaching me many of the statistical techniques used in the data analyses.

My thesis committee worked extremely hard and their input made for a high quality final product. Matt Riggs worked with me since my arrival at CSUSB and his support and encouragement throughout my tenure here is very much appreciated. Diane Halpern's expertise and insight added tremendously to my development as a researcher and to this project.

I have no idea what I would have done without my teacher, mentor, advisor, and friend Jan Kottke. Her unwavering confidence and optimistic outlook helped me get through the rough spots. Thank you.

My supervisors, Rhonda, Sharon, and Luci have been tremendously understanding while I completed this project.

My family has been a constant source of strength for me. They have been my lifelong teachers.

Cheryl Simmons has brought so much to my life this year and during the completion of this project has been very supportive.

To all who have contributed to my success at California State University, San Bernardino and to the completion of this project I offer my heartfelt thanks.

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Introduction

If you were a business executive or owner, would you like your managers to be: habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable, and focused in inquiry? Most business executives would answer with an enthusiastic, "Yes." With some minor modification, the preceding describes the ideal critical thinker (Facione, 1990).

Several of these activities require or would be enhanced by the ability to consider multiple perspectives. One can immediately see that being inquisitive, open-minded, flexible, honest in facing personal biases, and willing to reconsider requires or are definitionally close to multiple perspective taking. For example, being inquisitive and open-minded requires an individual to seek out and be open to a variety of viewpoints (multiple perspective taking). It is more difficult to see how multiple perspective taking could help an individual be more fair-minded in evaluation, prudent in making judgments, diligent in seeking relevant

information, reasonable and yet remain focused in inquiry. To the extent that multiple perspective taking assists in generating decision making alternatives and allows for evaluation from different perspectives, it will also be helpful with these actions. This research makes a theoretical connection between critical thinking and managerial success and ultimately argues that managers who are able to take multiple perspectives will be more successful than those who do not.

All organizations search for the right predictor variables to identify, hire, develop, and promote the people who will successfully lead their organizations. In today's fast changing economic environment, the proper variables have become difficult to identify. Some traditional criteria used to identify and promote people into leadership positions (e.g., length of employment, amount of formal academic training, performance at entry levels) have limited validity. Research by Campbell, Sessa & Taylor (1995) shows that executives selected based on technical expertise or business experience were more likely to be unsuccessful than successful. These traditional criteria have failed to work for a variety of reasons including: the rapid movement from a manufacturing to a service economy requiring different skills for organizational leaders (Toffler, 1985; Reich, 1983); the mismatch between formal academic training and

the needs of organizations (Chenault, 1987); and the rapid change of job descriptions due to reorganization and downsizing (Dachler, 1989). Critical thinking is one set of skills which holds promise for filling this void, as well as providing organizations with a reliable predictor variable.

Critical Thinking Defined

While theories of critical thinking have appeared with some consistency in the philosophy, psychology and business literature since Dewey (1933), only recently has a well-conceived definition of the construct appeared. Because critical thinking was used as a construct in a variety of fields and for a variety of reasons, there were many disparate definitions of the term. In part to address this confusion, the American Philosophical Association initiated the Delphi Project in 1988. The task of the Delphi Project was to use the Delphi method to arrive at a consensus definition of critical thinking. A group of 46 experts in critical thinking from a variety of disciplines participated in a series of roundtable discussions designed to distill the most pertinent concepts of critical thinking. After six rounds of

discussion, the Delphi panel came to consensus regarding the following definition of critical thinking.

> We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological or contextual considerations upon which that judgment is made. (Facione, 1990, p. 2)

From this definition, six cognitive skills essential to critical thinking were identified: interpretation, analysis, evaluation, inference, explanation, and self regulation. As one might expect from a large group process, the definitions of each of these skills is rather encompassing. For example, interpretation is defined as, "To comprehend and express the meaning or significance of a wide variety of experiences, situations, data, events, judgments, conventions, beliefs, rules, procedures or criteria" (Facione, 1990, p. 7). Of more value are the sub-classifications. Each of the six cognitive skills is further divided into sub-classifications. The sub-classifications provide definitions which are closer to the traditional operationalizations of psychologists (Figure 1).

Figure 1

Critical Thinking Skills and Subskills

Interpretation
- Categorization
- Decoding Significance
- Clarifying Meaning

Inference
- Querying Evidence
- Conjecturing Alternatives
- Drawing Conclusions

Analysis
- Examining Ideas
- Identifying Argument
- Analyzing Arguments

Explanation
- Stating Results
- Justifying Procedures
- Presenting Arguments

Self-Regulation
- Self-examination
- Self-correction

Evaluation
- Assessing Claims
- Assessing Arguments

Given the nature of the Delphi Method, no particular relationship between these six skills was identified. The tenor of the text suggests that the six are assumed to be conceptually independent.

The Delphi Panel attempted to create a discipline neutral definition of the construct of critical thinking. There are many other models of what constitutes critical thinking and how various subskills are structured (e.g., Ennis, 1986; Glaser, 1941). It is important to note that all of these models of critical thinking were developed with education (and particularly K-12) in mind. That is, none of the models were developed with business as the target arena.

While the Delphi Panel's work provides an excellent conceptual definition of critical thinking, for this definition to be valuable to business, it is important that people also act on their cognition. This behavioral aspect of cognition is only briefly touched upon by the Delphi Panel. In addition, it is important to emphasize the criteriological aspect of the definition for business. Clearly there can be good or poor interpretation, analysis, evaluation, or inference. In the business environment there are definite consequences for poor thinking (e.g., decreased profit, litigation,

adverse impact on people's careers). Therefore, the criteria by which we evaluate managers' and executives' critical thinking are important.

Some theorists of critical thinking point out a generative or creative component to critical thinking (e.g., Bailin, 1993; Brookfield, 1987; Halpern, 1996; Novelli & Taylor, 1993) which is missing from the common definitions of critical thinking, including the Delphi Panel's definition. The central conceptual argument presented in this research is that multiple perspective taking can enhance critical thinking - the process of coming to a judgment. Multiple perspective taking is not necessarily inherent in critical thinking, but its use can increase the real world usefulness of critical thinking in managers by increasing the number of alternatives an individual can consider and the number of perspectives/criteria by which to evaluate those alternatives. For example, as part of the evaluative and self-regulatory nature of critical thinking, people can change the criteria by which they make decisions regarding courses of action "on the fly," or respond as new information becomes available. Bailin asserts,

> arriving at an overall assessment in any complex circumstance requires constructing a new view derived from the questioning, weighing, rejecting, reconciling, and

> integrating of numerous divergent points of view. Critical thinking, then, involves synthesis, generation, and imagination. (p. 161)

Unfortunately, the instruments used to measure critical thinking fail to tap the generative aspect of critical thinking. As we shall see, these tests rely heavily on reasoning skills and assume that all the information necessary to solve problems or arrive at decisions is available. These assumptions are unlike real world situations in which managers needs to actively seek information and evaluate it from a variety of perspectives to arrive at the best decision possible.

With these caveats and this working definition of critical thinking, it is possible to make connections to existing theoretical and empirical research on employee effectiveness and, in particular, managerial effectiveness.

Critical Thinking and Job Performance

The increase of participatory decision making and the current popularity of teams provide two reasons for businesses to explore the potential usefulness of critical thinking as a criterion for selection and promotion. In order for participatory decision making to be effective, organizations need people who can analyze and evaluate information, take different perspectives,

communicate rationales, and come to decisions. Management often asks the members of its workforce to participate in decision making who were not necessarily hired to perform those functions, and therefore, may lack, at entry, the qualities necessary to contribute effectively or may even be detrimental to group decision making.

The same situation exists in the creation of teams in the work place. In order for a team to be effective, each member of the team must be able and willing to contribute. Lundberg (1992) asserts that each member of a team must "participate fully and actively, work to reach consensus and decisions, engage in fact finding and discovery work" (p. 97). The inference can be made that members of teams need to be good critical thinkers because the act of fact finding and decision making requires interpretation, analysis, evaluation of information and other components of critical thinking.

With the increased emphasis on decision making at all levels of organizations, some prominent authors have argued that all workers need to think critically. Marshall & Tucker (1992), for example, argue that all workers must be able to "think for themselves." This is particularly important given the business trends of total quality management, participative or decentralized decision making, and the use of teams. The argument

advanced in their book, Thinking for a Living, is that unless the United States invests in increasing the skill level of all employees, we will fall behind other post-industrial nations in economic capability.

The increasing emphasis on client service also adds to the potential value of critical thinking in the workplace. Good client service requires employees who have contact with clients to meet those clients' needs regardless of the specific tasks identified in the employee's job description. In fact, many frontline service job descriptions are being redefined. What is being called for "is people who are resilient and resourceful, empathic and enterprising, competent and creative" (Henkoff, 1994, p. 110); in other words, people who can evaluate situations and make decisions. Additionally, good client service requires the employee to understand the client's viewpoint - to take a perspective other than that of the employee or the organization.

While most jobs may require good critical thinkers, we should be cautious about concluding that all jobs require a significant amount of critical thinking. The scientific process of job analysis and credible validation procedures should remain the standard by which we evaluate the utility of critical thinking for specific positions (Gatewood & Feild, 1994). It is likely that

over time, the vast majority of jobs will require good critical thinkers. Today virtually all management positions require critical thinking.

In today's fast changing business environment, managers who can control information and work well in a constantly changing environment are more valuable than managers who control people and work to achieve stasis. Managers today "must be capable of exercising judgments and making complex value decisions rather than mechanically executing orders sent down from above" (Toffler, 1985, p. 283). Critical thinking skills are essential to managing well. Managers who are unable to exhibit these skills will likely prove to be detrimental to their business as they will be less likely to anticipate and adapt to the current business environment.

The fast changing environment has also resulted in presenting organizational leaders with more ill-structured problems than ever before. Novelli and Taylor (1993) define ill-structured problems as those where "it is not even clear what the relevant variables are, let alone how they can be arranged or manipulated to arrive at solutions" (p. 142). Novelli & Taylor (1993) suggest that organizations consider critical thinking training as a means of preparing people at various levels for eventual success as organizational leaders. The suggestion of using critical thinking training to assist

organizational leaders to handle ill-structured problems implies that Novelli & Taylor view critical thinking as both a generative skill (i.e., identify relevant variables) and an execution skill (i.e., use evaluative, interpretive, and logical to arrive at a decision).

The importance of critical thinking to organizations was emphasized at the 1996 meeting of the Society for Industrial and Organizational Psychology. In a roundtable discussion, practitioners in industrial and organizational psychology stated that the number one quality they look for in people holding advanced degrees in industrial/organizational psychology is the ability to think critically (Major, Vandaneer & Graddick, 1996). These professionals used a broad definition of critical thinking which encompassed both the judgment making processes as well as the generative component.

The potential use of critical thinking as a predictor of managerial success is contrary to one of the more common promotion practices in organizations. One of the usual rewards for good performance in typical hierarchical organizations is promotion (i.e., people who do well at lower levels of the organization get promoted). This practice presents a potentially damaging situation for both employees and organizations. In many organizations, the technical skills that are necessary to perform at lower levels of an organization may not be the

skills that are essential for success at upper levels of an organization (Sternberg, 1994). The qualifiers in this statement are important. It is possible that lower level positions require critical thinking and therefore, promotion from these positions into managerial positions would be less troublesome. Promotion from technical positions is not an universal concern, but given the management trends described above, it is a growing concern. Utilizing valid criteria for managerial development and promotion, rather than on some traditional criteria, will help to ameliorate this problem. Critical thinking may serve as one valid criterion for this purpose.

Those familiar with the business literature will notice some similarities between critical thinking and commonly used constructs in business, such as problem solving and decision-making. In practice it may be difficult to distinguish critical thinking from these constructs, however, they are each conceptually distinct. While some proponents of artificial intelligence may take issue, critical thinking is a uniquely human potential. If problem solving is defined as the simple execution of rules, problem solving can be done by a computer (e.g., arithmetic, game logarithms). In contrast, quality critical thinking in the real-world requires active information seeking, constant evaluation, and the

potential for unique outcomes. Critical thinkers design their own flexible criteria for evaluation rather than relying on static rules of execution.

Decision making can be (and often is) based on any number of criteria including: hunches, emotion, direct orders, and first option presented. Critical thinking differs from decision making in at least two significant ways. First, critical thinking is a purposeful cognitive process. Depending on the heuristic used, decision making may, or may not (e.g., direct orders), involve a purposeful cognitive process. Secondly, perhaps counter intuitively, critical thinking is not simply linear and logical. A good critical thinker is able to sift through all the available information to identify a problem or issue, evaluate the information, plan a course of action, act on that decision, and communicate the reasons for his/her conclusion.

The information one seeks to use in the decision making process is influenced by the perspective of the individual. The criteria for evaluation are also influenced by the perspective of the individual. If an individual can be flexible and cognitively accommodate a variety of perspectives (e.g., another's viewpoint, a different temporal perspective, consideration of changing environmental conditions) she or he will likely increase the number of possible courses of action and the

potential for higher quality decisions than those who choose to only consider their own viewpoint. It could be said that all critical thinking is decision making, but not all decision making is critical thinking.

This generative aspect of critical thinking also distinguishes it from reasoning. Reasoning is both deductive and inductive (Mayer, 1992). Reasoning is inductive when a person creates a general rule from a series of examples. Deductive reasoning refers to when a person draws a logical conclusion based on set of general principles. Deduction and induction are two core constructs of rule based logic. Reasoning is an excellent tool for solving well defined problems. However, the managerial world has few well defined problems, which limits its usefulness as a managerial tool.

Why Go Beyond g?

The emphasis on critical thinking in the workplace is a relatively recent phenomenon and little research has been conducted to reveal the potential connection between critical thinking and various criteria variables in business. However, there exists a considerable amount of research regarding intelligence and its utility as a

predictor of success in job settings. Traditional measures of intelligence, often referred to as IQ tests derived from the early Binet test of intelligence, have a long and controversial history in our culture. The debate over what IQ tests measure and their value in predicting job success has been renewed with the recent publication of The Bell Curve (Herrnstein & Murray, 1994). What IQ tests actually measure is still an open debate. Herrnstein & Murray (1994) emphasize heredity, others emphasize the role of culture and class (Herbert, 1994), still others remind us of the importance of personal life experiences (Cohen, Swerdlik, and Phillips, 1996).

Over time, what is considered "intelligence" has always been accompanied by great debate. Intelligence has moved from an essentially fact knowing construct to a highly analytic and process oriented construct. The development of the Graduate Record Exam (GRE) serves as an example. The initial GRE focused on two aspects of mental ability, verbal and quantitative. In the 1980s, the Educational Testing Service, which administers the GRE, created a more analytic test. The most obvious action in this movement was the testing and inclusion of the analytical section of the GRE. A less obvious

approach involved the restructuring of test questions to measure less fact knowledge and more logical (inference and deduction) ability. The purpose of this change was to measure more thinking skills which are discipline neutral, more predictive, and less culturally biased.

The debate over the definition of intelligence is also evidenced by the development of models of multiple intelligences. Two of the more notable contributions to this area are advanced by Gardner and Sternberg. Gardner (1982) offers evidence of eight distinctive forms of intelligence: linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal, and intrapersonal. Sternberg (1985) posits three types of intelligences which work together: analytical, creative, and practical. This active debate has also contributed to the current interest in critical thinking and other closely related cognitive abilities (e.g., creativity).

The literature is replete with research describing the relationship between general intelligence and job performance. g is defined as a single general factor that accounts for variance on mental ability tests (Spearman, 1927). The meta-analytic research of Schmidt and Hunter (1979) has spawned much of this research. Their research found a correlation after correction for statistical

artifacts (e.g., reliability) between g, as measured by the General Aptitude Test Battery (GATB), and performance, as measured by promotion, of .54 (Hunter, 1983). This correlation held across all types of jobs. g was the single best predictor of job performance accounting for approximately 29% of the variance in job performance. Numerous other research studies have reported similar findings (e.g., Pearlman, Schmidt & Hunter, 1980; Schmidt, Gast-Rosenbery & Hunter, 1980; Schmidt, Hunter, Pearlman & Shane, 1979).

Researchers have found several relationships between cognitive skills and leader effectiveness, for example: planning (Shipper & Wilson, 1992); problem solving (Carroll & Gillen, 1987); and decision making (Boyatzis, 1982). The research proposed here focuses on the underlying traits that make an individual a good planner, problem solver, and/or decision maker. This type of research is closely tied to studies that have found that levels of conceptual skills and cognitive complexity can distinguish effective leaders from non-effective leaders (Bass, 1990).

Given the strength of the empirical evidence of the relationship between g and job performance, one may question the utility of continuing to search for

predictor variables for job performance. A task force established by the American Psychological Association recently reported that, "it is worth noting, however, that such tests (IQ tests) predict considerably less than half of the variance of job-related measures. Other individual characteristics - interpersonal skills, aspects of personality, etc. - are probably of equal or greater importance, but at this point we do not have equally reliable instruments to measure them" (Neisser, et al, 1996, p. 83). Not only should we examine other skills and traits, but subsets of g. A specific mental ability factor may account for incremental variance in predicting job performance, depending on the job.

These observations on intelligence are offered as evidence of an active debate in which it is clear that there is room for further theory building and hypothesis testing. Specifically in industrial and organizational psychology, Guion (1993), emphasizes that even though we have found a good correlation between g and job performance, we should not abandon the search for better or incrementally valid (providing predictive power above and beyond g) predictors of job success. Snow & Snell (1993), citing the business trends mentioned at the opening of this paper, suggest that

industrial/organizational psychologists need to re-evaluate what we are selecting for in organizations. They suggest that organizations should look at staffing for fluid environments in which strategy is key. Commenting on the work of Snow & Snell (1993), Guion says that cognitive predictors are necessary for the models offered by Snow & Snell,

> but not the usual employment test factors. Abilities required in planning, or in identifying different possible consequences from a course of action, or in changing strategies in response to changed circumstances - these are cognitive abilities that have so far had little influence on conventional personnel selection assessments. (p. 492)

Identifying a variety of consequences and changing strategies in response to environmental conditions at not measured by traditional intelligence tests. These activities require behaviors different than (not in place of) the cognitive ability defined as g. The most obvious departure from g in this research is the inclusion of behavioral statements in the measure. The theoretical distinction between g and multiple perspective taking is that most g measures assess formal reasoning skills in either the verbal or numerical arenas. The behavioral approach is consistent with Hackman & Walton's (1986) functional approach to leadership. They wrote, "We

believe that leaders have to both *know* some things and know how to *do* some things" (p. 106, emphasis in original work). This functional approach to leadership allows for 'thinking leaders' to assess a situation, decide upon a course of action (cognition), and then apply the appropriate tools (behavior) to enhance performance (effectiveness). Measures of multiple perspective taking will tap into both cognition and behavior.

The Role of Personality

Most models of critical thinking also include a dispositional component to critical thinking (Facione, 1990; Watson & Glaser, 1980), however, no quality assessment tool has been developed to measure these dispositions. Consequently, research on the relationship between personality (or disposition) and critical thinking skills is sparse, especially in the business setting.

A significant amount of research has been conducted exploring the relationship between personality and job performance. Personality will be examined in this research based on the Big Five personality factors (extroversion, neuroticism, agreeableness, conscientiousness, openness to experience). The research

will explore the theoretical link between conscientiousness and openness to experience and multiple perspective taking. Prior research has found no empirical relationship between the other Big Five constructs, extroversion, neuroticism, agreeableness, and job success (Barrick & Mount, 1991; Ones, Schmidt & Viswesvaran, 1994).

In Barrick & Mount's (1991) meta-analysis of the Big Five personality constructs, conscientiousness reflects dependability, being careful, organized, hardworking, and persevering. In a meta-analytic study based on over 5,000 correlations, Ones, Schmidt & Viswesvaran (1994) found a correlation between conscientiousness and supervisory ratings of job performance to be .34. They state that conscientiousness is the "only dimension of personality with generalizable validities across jobs and organizations" (p. 5).

The research on openness to experience is much less definitive. Barrick & Mount (1991) state that openness to experience is related to such concepts as imagination, culture, curiosity, originality, intelligence, and artistic sensitivity. Barrick & Mount (1991) found that openness to experience was predictive of training success across a number of job categories. Because openness to

experience has the highest correlation of the Big Five to cognitive ability (McCrea & Costa, 1987), Barrick & Mount (1991) suggest that openness to experience is "actually measuring ability to learn as well as motivation to learn" (p. 20). One would expect openness to experience to be positively correlated with multiple perspective taking to the extent that taking a variety of viewpoints requires one to be willing to receive and incorporate different information (ability to learn). The purpose of using the openness to experience scale is to examine the theoretical link between openness and multiple perspective taking. Openness to experience has also shown to be negatively correlated with conscientiousness (Barrick & Mount, 1991; Cortina, Doherty, Schmitt, Kaufman, & Smith, 1992; Ones, Schmidt & Viswesvaran, 1994).

Multiple Perspective Taking

As used in this paper, the core cognitive processes which define critical thinking are interpretation, analysis, evaluation, and inference. Taking multiple perspectives allows a person to expand the potential options in each of these processes and therefore is

related to the effectiveness of critical thinking. Multiple perspective taking not only aids in the areas mentioned, but assists in problem definition - an often over looked but vital component to managerial performance.

The value of multiple perspective taking for managers can be inferred from the literature on group decision making processes. Three areas will be examined here. The first is based on the research and theory of groupthink (Janis, 1972). Second, some comparison will be made between the effectiveness of a devil's advocacy treatment in a group setting. Lastly, research on the value of diversity of thought/perspectives in groups will be presented. I will offer a working definition of the construct of multiple perspective taking at the end of this section.

Janis (1972) identified groupthink as a dangerous possibility for groups. Taking examples from groups involved in high stakes socio-political decisions (e.g., the Kennedy administration during the Bay or Pigs), Janis defined groupthink as, "a mode of thinking that people engage in when they are deeply involved in a cohesive in-group, when members' strivings for unanimity override their motivation to realistically appraise alternative

courses of action" (p. 9). By definition groupthink is at odds with an intuitive definition of multiple perspective taking. One of the critical threads running throughout Janis' eight preventative measures of groupthink is the value of multiple perspective taking. He suggests that each member of the group critically evaluate all ideas and express any doubts about the various alternative courses of action the group is considering. The main purpose of the preventive measures is to stop a premature (and perhaps fictitious) consensus decision. A premium is placed on developing alternatives.

One strategy for developing alternatives in groups is the use of a devil's advocate. A devil's advocate is a group member who constantly challenges the assumptions of the group. Valacich & Schwenk (1995) provide evidence of the value of a devil's advocate in increasing the effectiveness of group decisions. Groups were given one of three treatments designed to increase the quality of decision the group made: devil's advocacy, dialectical inquiry, expert advice. After receiving the treatment, the groups worked on a business case in which effectiveness of decisions was measured in economic terms. The group given the devil's advocacy treatment

considered more alternatives and came to better decisions than either of the other two treatment groups.

The make-up of a group can also increase the quality of a decision. Bantel & Jackson (1989) write, "when solving complex, non-routine problems, groups are more effective when composed of individuals having a variety of skills, knowledges, abilities and perspectives" (p.109, emphasis added). Bantel & Jackson (1989) found empirical support for this hypothesis. These researchers found that diverse management teams made more innovative, higher-quality decisions than teams which were less diverse based on expert generated indices of technical and administrative innovation.

While this research is on groups it is possible to draw some parallels with individuals. What I assert is that it is possible for an individual to play a devil's advocate position with oneself or to engage in divergent thinking while engaged in problem solving. In devil's advocacy, there are essentially two points of view; the proposed plan and a critical perspective which questions the original plan, but does not offer alternative viewpoints or suggestions. Dialectical inquiry also only provides two primary viewpoints. While 'two' meets the minimum criteria for 'multiple,' in real business

situations, there are likely to be more than two viewpoints. If one scans, in a simplistic way, the usual business environment, he or she will find multiple constituencies (e.g., employees, management, owners, community, legal system, government) each with a unique stake in a business.

The ability of the individual to hold two or more potentially conflicting viewpoints in mind is at the heart of multiple perspective taking. Multiple perspective taking is the action of questioning one's decision making assumptions, taking the viewpoint of another(s), or viewing a problem/situation from a variety of perspectives. By definition, in order to take another perspective, one must be able to identify her or his current viewpoint and assumptions and seek out alternative sources of information in a purposeful way.

It is imperative that information seeking be done in a proactive and purposeful way. This means that an individual cannot passively wait for information to arrive. The individual must be active in seeking information.

Theoretical support for the value of multiple perspective taking comes from the burgeoning literature on learning organizations. Organizational learning

refers to the process of organizations learning how to solve problems differently rather than trying to 'put out fires' on a continual basis (Burke, 1992). Burke summarizes a key point of Senge (1990) when he writes,

> According to Senge, for organizational learning to occur, members and especially managers and executives must develop systems thinking. To understand complex managerial problems one has to visualize the organization as a whole, how one aspect of the system affects another within an overall pattern. (p.14)

This visualization process involves the ability to see a problem from a variety of perspectives.

Need for Measurement Devices for Organizations

Sternberg (1985) wrote,

> the most critical need in ability testing today is to develop measures that are more sensitive to real-world kinds of intelligence. These tests would supplement the academic kinds of intelligence measured by traditional tests. (p. 311)

A review of the Eleventh Mental Measurements Yearbook (1992)and Tests in Print (1994) reveals a dearth of published instruments designed specifically for use with managers in organizations. Most cognitive ability and intelligence tests designed for adults measure verbal or numerical reasoning. Many available tests marketed to organizations to identify managerial potential rely

heavily (or exclusively) on reasoning skills (e.g., Wonderlic Personnel Test, 1992; Graduate and Managerial Assessment, 1985; Critical Reasoning Tests, 1992). Reasoning tests measure an individual's ability to make the correct deduction/inference from a set of premises which are assumed to be all the information necessary to make a decision.

The recent emphasis on critical thinking has led to an interest in measuring it. Even while researchers are in the theory development stage, it is important to begin to make inroads in measurement. The two most widely used measures of critical thinking are the Cornell Critical Thinking Test (CCTT)(Ennis, Millman, & Tomko, 1985) and the Watson-Glaser Critical Thinking Appraisal (CTA)(Watson & Glaser, 1980). A third, and more recent standardized test is the California Critical Thinking Skills Test (Facione, 1992). All three tests use a multiple choice format. These tests also fall prey to the same difficulty of reasoning tests. That is, they present a specific set of information which an individual must assume is all the information necessary and select the one correct answer from a given set of options. As mentioned previously, this is unlike most real-world situations in which is necessary to define a problem,

seek information, and then use critical thinking skills to arrive at an outcome.

Reviewers of the CCTT question the method in which the test was developed and cite relatively low reliabilities between .50 and .77 for the version of the test that would be used in the business setting (Hughes, 1992; Malcolm, 1992).

The California Critical Thinking Skills Test has a published reliability of .70. McMorris (1994) also questions the way in which test items were developed (e.g., "Was the key independently verified by experts?"). There is little published research on the CCTST and it is relatively untested outside of the nursing education field.

The CTA has good psychometric properties with reliabilities from a variety of populations ranging from .67 to .85, but was not developed with business in mind and has not been widely used by business. The manual for the CTA also states that subscores on the test (inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments)should not be used to evaluate individuals. The psychometric properties of the subscales make interpretation invalid. This severely limits the use of the CTA for developmental

purposes. Because none of these tests is behaviorally based may be one reason business has not warmed to them. Business tends to shy away from instruments which are not face valid. An easy to administer, behaviorally based, paper and pencil instrument would be a valuable addition to organizational arsenals in the search to identify and develop high quality managers.

While the current project will fall short of the development of an objective cognitive appraisal tool, it is the intent of the research to begin to isolate the construct of multiple perspective taking. With this accomplished, the process of developing of a high quality, objective, criterion referenced assessment instrument can begin.

Hypotheses

The primary purpose of this study to develop a behaviorally oriented measure of the multiple perspective taking construct as defined earlier. Item analyses will be run on the multiple perspective taking measure. Items which do not meet specified criteria will be eliminated from the measure.

Hypothesis One: It is expected that a short (10-15 item) action oriented instrument will result with a

Cronbach's alpha greater than .80. This instrument will be called the MPT-1.

Hypothesis Two: The MPT-1 is expected to be unidimensional.

Hypotheses Set Three: The nature of the relationships between CTA, openness to experience, conscientiousness, and MPT-1 will be examined (Table 1).

A) While the central conceptual argument presented here asserts that multiple perspective taking can enhance critical thinking outcomes, the measurement instruments available will not reflect this relationship. Because the CTA is a right/wrong answer test and discourages the use of information seeking outside that provided by the test, it is hypothesized that there will be a negative relationship between the CTA and the MPT-1.

B) Based on the meta-analytic research cited above, it is hypothesized that there will be a negative relationship between conscientiousness and openness to experience.

C) Given this negative relationship and the similarity of the constructs of multiple perspective taking and openness to experience, it is hypothesized

that there will be a positive relationship between the MPT-1 and the openness to experience scale.

D) Additionally, there will be a negative relationship between the MPT-1 and conscientiousness.

E) Again, because the CTA fails to capture the generative aspects of critical thinking, it is hypothesized that there will be a negative relationship between the CTA and openness to experience.

F) Given the nature of the CTA and the definition of conscientiousness, a positive relationship between the CTA and conscientiousness is hypothesized.

Table 1

Hypothesized Direction of Correlation Coefficients

	MPT-1	CTA	Conscientiousness	Openness to Experience
MPT-1	1			
CTA	-	1		
Conscientiousness	-	+	1	
Openness to Experience	+	-	-	1

Given the current debate among psychologists, particularly industrial/organizational psychologists (Ones & Viswesvaran, 1996) around the usefulness of significance testing, in addition to the significance

tests of the correlation coefficients, confidence intervals will be calculated around the point estimates.

Due to the exploratory nature of this research, no path analysis or other confirmatory analyses will be run.

Additional Analyses: Several demographic variables will be evaluated to examine their relationship to critical thinking, multiple perspective taking, conscientiousness, and openness to experience. Pearson correlations will be calculated and post hoc interpretations offered for the relationship between the measures and the continuous demographic variables, age and years of full-time work experience.

ANOVAs will be calculated for categorical demographic variables. It is hoped, but not hypothesized, that there will be no differences on the multiple perspective taking measure and group membership on education, gender, and ethnicity.

Of scientific interest, but not of use to the development of the MPT-1 is the relationship between group membership and performance on the CTA and personality scales. ANOVAs will be run to examine these relationships.

Chapter Two

Method

Participants

Fifty-three participants were solicited from graduate and undergraduate courses at California State University, San Bernardino, and from public agencies including the City of Riverside and County of Sacramento, and various private organizations. This number of participants provides adequate power for the correlational analyses with α=.05 and a medium effect size (Cohen, 1992).

Students were solicited from classes. Full-time workers were solicited by contact people in various public sector organizations. Surveys in all cases were distributed and participants completed them on their own time. The surveys were collected by various contact people in the respective organizations and forwarded to the author.

A summary of demographic characteristics of the sample is in Table 2. 58% of the sample were men and 41% were women. The mean age of participants was nearly 30 (SD=7.94), and they had an average of over nine years of full-time work experience. Two-thirds of participants had managerial experience. No significant differences

were found on any of the demographic variables and the four measures except for managerial experience on the MPT-1 and openness to experience scales.

Table 2

Demographic Statistics

Variable		N	Percentage
Gender			
	Male	31	58.49%
	Female	22	41.51%
Ethnicity			
	African-American	3	5.66%
	Asian-American	4	7.55%
	Chicano/Latino	14	26.42%
	Native American	1	1.89%
	White	29	54.72%
	Other	2	3.77%
Education			
	Less Than High School Diploma	2	3.03%
	High School Diploma	17	25.76%
	Some College	19	28.79%
	College Graduate	8	12.12%
	Some Graduate School	8	12.12%
	Master Degree	12	18.18%
	Doctoral Degree	0	0.00%
Managerial Experience			
	Yes	36	66.67%
	No	18	33.33%
Currently a Manager			
	Yes	21	39.62%
	No	32	60.38%

Measures

The primary instrument of interest here was the multiple perspective taking instrument (Appendix A). Twenty-six items were written to reflect the four general ideas present in the definition of multiple perspective taking offered here: questioning one's assumptions; know one's own viewpoint; be open to/take a variety of perspectives; and information seeking. Care was taken to include negatively worded prompts. The eleven point Likert scale using percentage of time as the metric was chosen because it offers an easily understandable scale and potentially interval level data. Increments of ten percent allow for a variance of response and is cleaner than a scale with more than more six points (e.g., a seven point scale would result in percentages of time including 14.28%, 28.57).

The multiple perspective taking instrument was scored by summing the total of all items for each participant. Each item was scored on a scale from zero to ten based on the participant's response. Seven items were reverse coded (items 6, 8, 10, 12, 21, and 22).

A subset of Saucier's (1994) Mini-marker Set was used to assess conscientiousness and openness to experience. These subscales for conscientiousness and openness to experience consist of a total of 16

adjectives rated by participants on a nine point Likert scale (Appendix B). The openness to experience and conscientiousness scales had alpha coefficients of .78 and .83 respectively.

The Watson-Glaser Critical Thinking Appraisal (CTA) was selected as the instrument to measure critical thinking. The CTA is an 80 item untimed test. This test was selected because it is untimed, and as mentioned earlier, has reasonable psychometric properties (published alpha coefficients of .67 to .85).

A g measure was not included for three reasons. First, the link between critical thinking and multiple perspective taking is theoretically stronger than that between g and multiple perspective taking. Second, given the length and difficulty of psychometrically sound g and critically thinking measures, there would likely be a fatigue factor for participants which would decrease the usefulness of the data if both were administered. Third, the data collection method of this project and the timed nature of most g measures (e.g., the Wonderlic) are incongruent.

In addition to the four instruments, some demographic data was also collected (e.g., sex, age, ethnicity, work experience)(Appendix C).

Chapter Three

Results

Prior to any analyses being run, data was examined for normality and linearity. 10% of the data were randomly checked for data entry errors. No errors were found.

The MPT-1

Several item analyses were run on the multiple perspective taking instrument. The item analysis run on twenty-six item instrument resulted in an alpha coefficient of .78. Items with low item-total correlations (<.2) were eliminated, as were items which detracted from the overall reliability of the eventual instrument. This process eliminated items 5, 6, 8, 12, 13, 14, and 25. Items 25 and 28 were eliminated based on the "Alpha if Item Deleted" information. The other items were deleted based on low item-total correlations. The item analyses were run on the full measure before the principal components analysis because the purpose of the research was to develop a measure of the multiple perspective taking construct. Any items not contributing to measurement of the construct were not of interest. Conducting the item analysis first led to a clean

instrument on which to run the principal components analysis.

An examination of the deleted items revealed that the items were ambiguous in nature and did not capture the multiple perspective taking construct as well as other items. For example, item 25 read, "I struggle with decisions which have significant consequences." This item has a weak relationship to multiple perspective taking as defined here because struggling with a decision does not signify taking multiple perspectives.

Item analyses of the resultant instrument are in Table 3. The 19 item scale had a reliability of .83. It contains 4 items which are negatively worded (reverse coded).

Table 3

Item Analysis of 19 Item
Multiple Perspective Taking Instrument

Item		Corrected Item-total Correlation
1	I can explain my decisions to others.	0.4573
2	I am aware of my personal biases.	0.3507
3	I think about how I make decisions.	0.4179
4	I think about the pros and cons of my decisions.	0.3629

7	I am open to suggestions.	0.4481
9	I consider the ramifications of my decisions.	0.4281
10	I go with my 'gut' feeling when making a decision.	0.2118
11	I ignore information which contradicts my chosen course of action.	0.2122
15	I understand an opponent's position when in a conflict.	0.4162
16	I seek out the opinions of people who I know may disagree with me.	0.4526
17	I can articulate the arguments against the course of action I have chosen.	0.5495
18	I believe there is more than one side to every story.	0.5500
19	I consider multiple viewpoints before making a decision.	0.6352
20	I ask someone to play devil's advocate with me before I make a decision.	0.5928
21	I believe once a decision is made, it should be final.	0.2329
22	I make better decisions without input from others.	0.2261
23	I can explain why I did not take alternative courses of action to others.	0.6062
24	I write down the consequences of various solutions to a problem before making a decision.	0.4558
26	I can articulate the arguments in favor of a variety of alternative courses of action.	0.6691

The primary purpose of this study was to begin to isolate the construct of multiple perspective taking and develop a short instrument which would reliably measure

the construct. The initial item analyses support the success of this effort. To assess the expected unidimensionality of the MPT-1, a principal components analysis (PCA) was run. PCA was selected over factor analysis because of the way in which variance is utilized to generate a factor solution. PCA uses all variance available among variables. Given that the purpose of this research was to examine what was hypothesized to be a single construct, it was important to use all the variance available. Factor analysis partitions out error variance before generating a factor solution. This method was determined to be incompatible with the purpose of the present study.

The initial PCA suggested a single factor solution. The results of the PCA are in Table 4. There clearly was one major factor with an eigenvalue of 5.55 accounting for 29.2% of the variance of the 19 item scale. Items loading on the second factor (eigenvalue of 2.5) clustered around a self-reflective component (i.e., I think about how I make decisions. I am aware of my personal biases.). This self-reflective component is part of the multiple perspective taking construct as defined here. That is, it is asserted that in order to take a variety of viewpoints, it is necessary to know the viewpoint currently held. Or, to challenge one's assumptions, one must know what the assumptions are.

When a single factor solution was forced, four items of the MPT-1 had loadings of less than .3 (Table 5). When these items were eliminated from the 19 item scale, reliability increased to .86 (Table 6). The 15 item scale will be called the MPT-1. Unfortunately, the remaining negatively worded items were eliminated.

A principal components analysis was run on the MPT-1 (Table 7). This analysis again suggested a single factor solution. The major factor had an eigenvalue of 5.4 and accounted for 36.5% of the variance. A forced single factor solution resulted in all items having loadings between .46 and .82 (Table 8). The second factor accounted for an additional 15.3% of the variance.

Table 4

Principal Components Analysis of 19 Item Multiple Perspective Taking Instrument

Factor	Eigenvalue	Pct. of Var.	Cum. Pct.
1	5.5	29.20	29.2
2	2.5	12.90	42.2
3	1.8	9.70	51.9
4	1.4	7.60	59.5
5	1.4	7.20	66.8
6	1.1	6.00	72.8

Table 5

Factor Loadings for

19 Item Multiple Perspective Taking Instrument

Single Solution Forced

Item		Factor Loading
26	I can articulate the arguments in favor of a variety of alternative courses of action.	0.8032
23	I can explain why I did not take alternative courses of action to others.	0.7553
19	I consider multiple viewpoints before making a decision.	0.7376
18	I believe there is more than one side to every story.	0.6576
17	I can articulate the arguments against the course of action I have chosen.	0.6546
20	I ask someone to play devil's advocate with me before I make a decision.	0.6519
1	I can explain my decisions to others.	0.5804
9	I consider the ramifications of my decisions.	0.5238
15	I understand an opponent's position when in a conflict.	0.5185
7	I am open to suggestions.	0.5159
3	I think about how I make decisions.	0.5151
16	I seek out the opinions of people who I know may disagree with me.	0.5000
24	I write down the consequences of various solutions to a problem before making a decision.	0.4904

4	I think about the pros and cons of my decisions.	0.4808
2	I am aware of my personal biases.	0.4683
10	I go with my 'gut' feeling when making a decision.	0.2319
21	I believe once a decision is made, it should be final.	0.2309
22	I make better decisions without input from others.	0.2248
11	I ignore information which contradicts my chosen course of action.	0.1759

Table 6

Item Analysis of MPT-1

Item		Corrected Item-total Correlation
26	I can articulate the arguments in favor of a variety of alternative courses of action.	0.7567
23	I can explain why I did not take alternative courses of action to others.	0.6436
20	I ask someone to play devil's advocate with me before I make a decision.	0.6053
17	I can articulate the arguments against the course of action I have chosen.	0.5918
19	I consider multiple viewpoints before making a decision.	0.5830
1	I can explain my decisions to others.	0.5136
18	I believe there is more than one side to every story.	0.5085
9	I consider the ramifications of my decisions.	0.4758
16	I seek out the opinions of people who I know may disagree with me.	0.4755
15	I understand an opponent's position when in a conflict.	0.4665
24	I write down the consequences of various solutions to a problem before making a decision.	0.4640
4	I think about the pros and cons of my decisions.	0.4225
2	I am aware of my personal biases.	0.4113
3	I think about how I make decisions.	0.4002
7	I am open to suggestions.	0.3877

Table 7

Principal Components Analysis of MPT-1

Factor	Eigenvalue	Pct. of Var.	Cum. Pct.
1	5.4	36.20	36.2
2	2.3	15.30	51.5
3	1.5	9.80	61.2
4	1.1	7.60	68.8

Table 8

Factor Loadings for MPT-1

Single Solution Forced

Item		Factor Loading
26	I can articulate the arguments in favor of a variety of alternative courses of action.	0.8243
23	I can explain why I did not take alternative courses of action to others.	0.7461
19	I consider multiple viewpoints before making a decision.	0.6833
20	I ask someone to play devil's advocate with me before I make a decision.	0.6701
17	I can articulate the arguments against the course of action I have chosen.	0.6534
18	I believe there is more than one side to every story.	0.6102
1	I can explain my decisions to others.	0.6089
9	I consider the ramifications of my decisions.	0.5686
15	I understand an opponent's position when in a conflict.	0.5452
16	I seek out the opinions of people who I know may disagree with me.	0.5323
24	I write down the consequences of various solutions to a problem before making a decision.	0.5144
4	I think about the pros and cons of my decisions.	0.4981
7	I am open to suggestions.	0.4863
3	I think about how I make decisions.	0.4823
2	I am aware of my personal biases.	0.4683

Descriptive Statistics

Descriptive statistics for the four measures (MPT-1, CTA, openness to experience, and conscientiousness) are in Table 9.

Table 9

Descriptive Statistics for the MPT-1, CTA, Openness to Experience, and Conscientiousness Scales

Scale	MIN	MAX	MEAN	SD
MPT-1	61	149	103.9	19.88
CTA	34	70	55.1	9.96
Openness to Experience	1.75	8.5	6.7	1.4
Conscientiousness	3.88	8.88	7.3	0.97

The descriptive statistics for the MPT-1 and the CTA reveal a wide range of scores. The mean for the CTA are similar to those found among college students published in the test manual (53.8 for college freshmen and 59.2 for upper division college students).

Correlation Coefficients

The correlation coefficient matrix of the four instruments (Table 10) reveals no support for the stated

hypotheses. However, there were several significant relationships between measures.

The uncorrected correlation between multiple perspective taking and critical thinking was significant in a positive direction ($r=.439$) at $p<.01$.

The uncorrected correlation between multiple perspective taking and conscientiousness was significant ($r= .383$) at $p<.01$.

The uncorrected correlation between conscientiousness and critical thinking was not significant at $p<.05$.

Of particular interest in this study are the correlations between the MPT-1 and the other three measures. Figures 2, 3, and 4 plot the regression line between the MPT-1 and the three measures, as well as the 95% confidence interval for each line.

Table 10

Correlation Matrix of MPT-1, CTA,

Openness to Experience, and Conscientiousness Scales

	MPT-1	CTA	Openness	Conscientiousness
MPT-1	1	0.439**	0.248	0.383**
CTA		1	0.326*	0.162
Openness			1	0.283*
Conscientiousness				1

*p<.05, **p<.01

Figure 2

Regression Line and 95% Confidence Interval between MPT-1 and the CTA

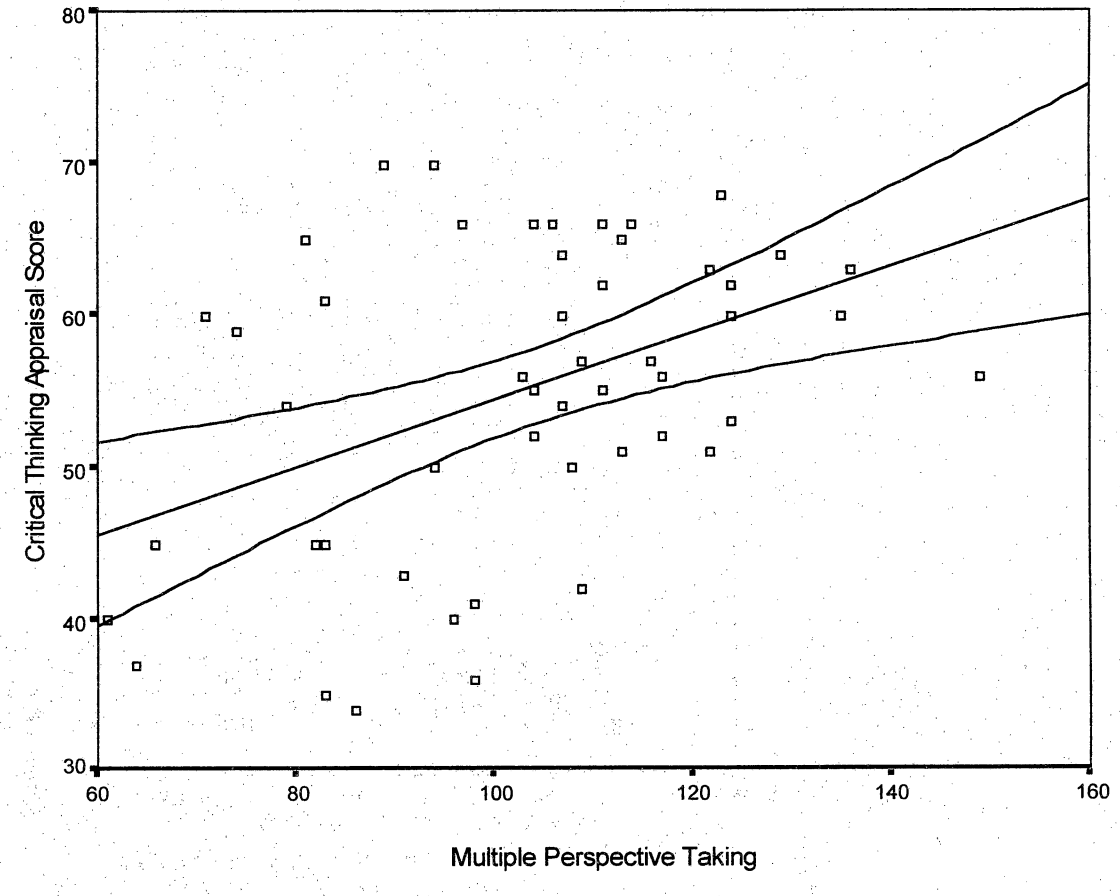


Figure 3

Regression Line and 95% Confidence Interval between MPT-1 and Conscientiousness

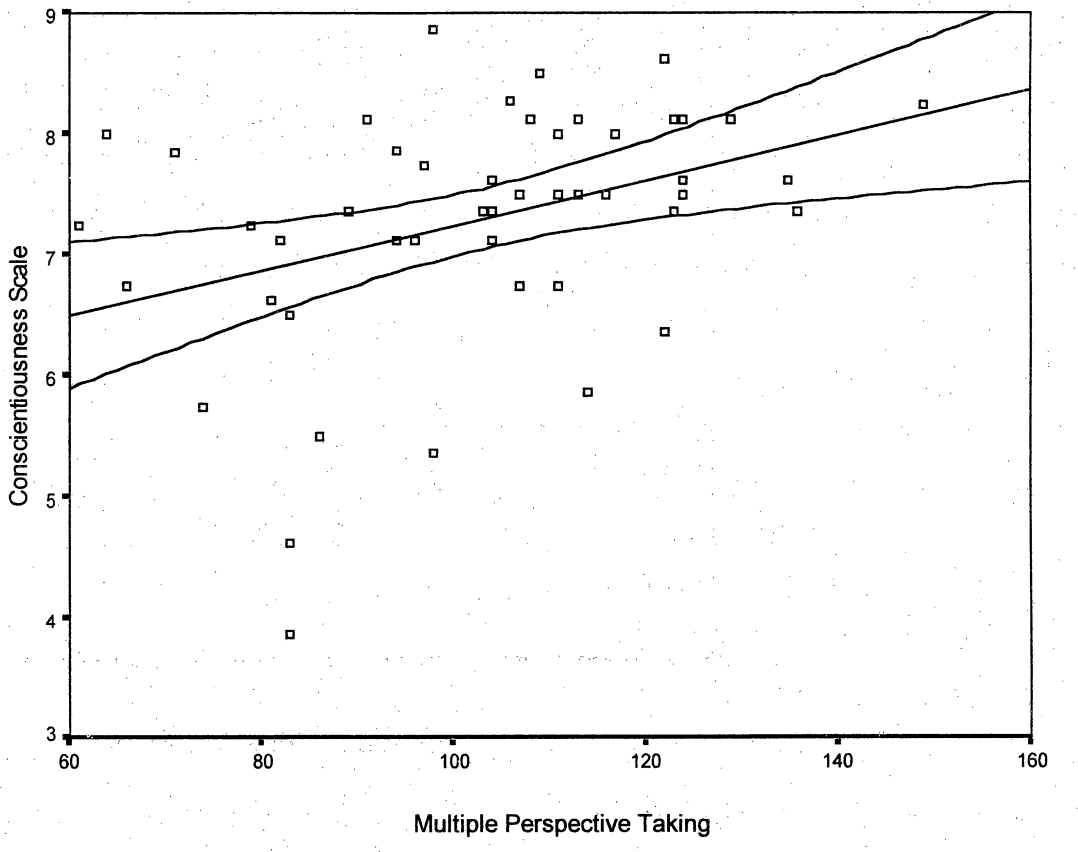
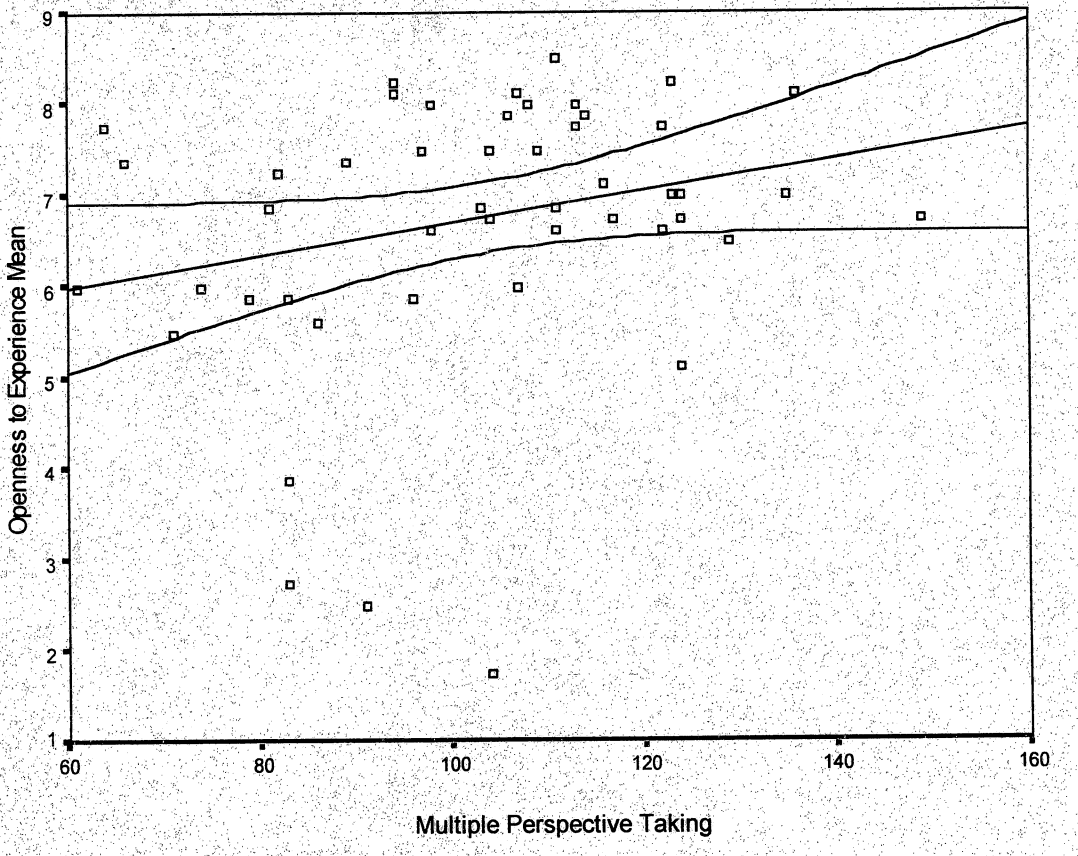


Figure 4

Regression Line and 95% Confidence Interval between MPT-1 and Openness to Experience



To examine the strength of these relationships if perfectly reliable instruments were available, correlations corrected for attenuation (reliability of measures) were calculated (Table 11). The correction for attenuation magnified the observed relationships. The alpha coefficient used in the correction for attenuation calculations were .85 for the CTA (the highest alpha reported in the Mental Measurements Yearbook), .86 for the MPT-1, .86 for the conscientiousness scale, and .78 for the openness to experience scale.

Table 11

Correlation Matrix of MPT-1, CTA, Openness to Experience, and Conscientiousness Scales Corrected for Attenuation

	MPT-1	CTA	Openness	Conscientiousness
MPT-1	1	0.513****	0.302*	0.453***
CTA		1	0.400**	0.192
Openness			1	0.351**
Conscientiousness				1

*p<.05, **p<.01, ***p<.001, ****p<.0001

Group Differences on the MPT-1

Analyses of variance (ANOVAs) were run between the MPT-1 and the demographic variables of education and ethnicity to examine potential group differences. No significant group differences were found on any of these variables which bodes well for the usefulness of the MPT-1. Due to modest power, the lack of group differences requires additional research.

Correlations between age and work experience, and the MPT-1 were not significant.

t-tests between gender, and the two questions related to managerial experience (Were you ever a Manager? and Are you currently a manager?) resulted in one significant difference. Participants who had managerial experience at some point in their lives scored significantly higher on the MPT-1 than those who had never had managerial experience ($t = 2.68$, $df=52$, $p<.05$).

ANOVAs were also run with the variables of managerial experience and courses taken in areas which may have provided skills training in multiple perspective taking (e.g., critical thinking, conflict resolution, logic). Again, no significant relationship was found.

Group Differences on Personality and the CTA

Although periphery to the research here, the same set of analyses which were run with the MPT-1 to examine potential group differences were run on the CTA, and the two personality subscales. The only significant differences were found between those who had ever had managerial experience and those who had not on the openness to experience scale (t=2.73, df=51, $p<.01$). Participants who had managerial experience scored significantly higher.

Chapter Four

Discussion/Implications

Although correlational results obtained did not support the stated hypotheses, the results have meaning. One possible explanation of the positive correlations across the board is the test method. All of the instruments rely on verbal skills. It is possible that this common method accounts for some of the shared variance.

Another possible explanation is the nature of the how the constructs were measured. As mentioned previously, there is disagreement on the definitions of the constructs of conscientiousness, openness to experience, and critical thinking. Add to this mix an attempt to define the construct of multiple perspective taking, and hypothesizing the direction of relationships is a risky endeavor.

It is also possible that the stronger correlations between critical thinking, multiple perspective taking, and openness to experience can be explained by test takers ability to suspend their initial decisions on the CTA and search for better response. This could be thought of in terms of multiple perspective taking. That is, those who did well on the CTA were successful at taking the test makers' viewpoint (not their own 'gut' or

initial reaction) and consequently, they would also receive higher scores on the MPT-1 and the openness to experience measures.

The rather surprising correlation between conscientiousness and openness to experience may be explained by the nature of the adjectives used in the Mini-marker Set (Saucier, 1994). The openness to experience construct has several prompts related to intelligence. The conscientiousness scale has several prompts related to attention to detail and organization. It is possible that the adjectives reflecting these concepts created a source of shared variance.

The results emphasize the necessity for well developed definitions of constructs commonly used in industrial/organizational psychology and the necessity of well designed and researched measurement devices.

The theoretical argument presented here deserves further attention. That is if valid measures of critical thinking and multiple perspective taking were available, they would have the potential to greatly benefit progressive, learning organizations.

In real-world managerial settings, there is limit as to how much information seeking and thinking about problems one can do before that activity becomes detrimental to the organization. If individuals are not purposeful or attentive to problem relevant information,

they run the risk of being overwhelmed by the amount of information available or failing to reach a decision at all - either consequence would be detrimental to a business organization. There is likely a curvilinear relationship (inverted U) between multiple perspective taking and managerial effectiveness. This relationship also deserves attention.

Some would question the validity of searching for predictors of effectiveness of upper management and executives (Meindl, Ehrlich, & Dukerich, 1985; Pfeffer, 1977), believing that organizational effectiveness is out of the control of these organizational leaders and dependent on environmental conditions (e.g., economic trends, peace/war). I agree with Posner and Kouzes (1987), Peters and Waterman (1982), Katz and Kahn (1978), and others who believe that organizational leaders have a significant impact on organizational effectiveness. General environmental conditions may have an impact of the level of success of organizations, however, effective leaders will be able to maximize success in any set of circumstances. Good environmental conditions do not ensure success, and poor environmental conditions to not automatically lead to ruin.

One benefit of emphasizing an expanded definition of critical thinking in managers is that it creates some consistency in what happens in the traditional training

grounds of organizational leadership - educational institutions. In recent years, accreditation agencies and state legislatures have begun to press colleges and universities to measure student outcomes. One of the areas where pressure has been greatest and most promising is in measuring and teaching critical thinking skills (Kurfiss, 1990).

Because of the broad domain of critical thinking, beyond the probable usefulness of teaching critical thinking to employees to increase organizational productivity and competitiveness, there are some benefits that accrue to good critical thinkers in our society. People make a great number of decisions on a daily basis. The quality of these decisions (whom to vote for, how to interpret media stories, what insurance plan is best, etc.) would all improve with increased critical thinking skills (Halpern, 1996).

While critical thinking can greatly serve business, it is not a panacea. If critical thinking will eventually be used as part of a criteria scheme to make employment decisions, employers should make sure that critical thinking is essential to the job. Additionally, the ability to think critically is not a replacement for domain specific knowledge. That is, an excellent critical thinker trained as an engineer may not perform

as well in a stock broker position as an average critical thinker trained as stock broker in the same position.

Further research regarding critical thinking and business is needed. One rich area for research is in assessment. While there are some useful critical thinking instruments in the marketplace, none have been developed with business in mind. The development of a valid critical thinking instrument for business, particularly utilizing an expanded definition of critical thinking (to encompass the generative aspect) would be a major step in increasing the impact of critical thinking in the business environment.

Appendix A
Multiple Perspective Taking Instrument

How do you make decisions?

When responding to the next 26 statements think about how you approach problems or decisions at work. Please put a checkmark in the box that best represents what percentage of time (how often) you do what that statement says.

		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
1	I can explain my decisions to others.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2	I am aware of my personal biases.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3	I think about how I make decisions.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4	I think about the pros and cons of my decisions.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5	I ask for advice before making a decision.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6	I make decisions without the input of others.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7	I am open to suggestions.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8	I don't care what others think of my decisions.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9	I consider the ramifications of my decisions.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10	I go with my 'gut' feeling when making a decision.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11	I ignore information which contradicts my chosen course of action.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12	I make decisions immediately after I am presented with a problem.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13	I ask the opinion of experts before making a decision.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
14	I seek out sources of information that support my viewpoint.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
15	I understand an opponent's position when in a conflict.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
16	I seek out the opinions of people who I know may disagree with me.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
17	I can articulate the arguments against the course of action I have chosen.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
18	I believe there is more than one side to every story.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
19	I consider multiple viewpoints before making a decision.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
20	I ask someone to play devil's advocate with me before I make a decision.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
21	I believe once a decision is made, it should be final.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
22	I make better decisions without input from others.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
23	I can explain why I did not take alternative courses of action to others.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
24	I write down the consequences of various solutions to a problem before making a decision.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
25	I struggle with decisions which have significant consequences.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
26	I can articulate the arguments in favor of a variety of alternative courses of action.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Appendix B
Mini-Marker Set

How Accurately Can You Describe Yourself?

Please use this list of common human traits to describe yourself as accurately as possible. Describe yourself as you see yourself at the present time, not as you wish to be in the future. Describe yourself as you are generally or typically, as compared with other persons you know of the same sex and of roughly your same age.

Next to each trait, please circle the number which indicates how accurately that trait describes you, using the following scale:

		Inaccurate				?	Accurate			
		Extremely	Very	Moderately	Slightly		Slightly	Moderately	Very	Extremely
		1	2	3	4	5	6	7	8	9
1	Organized	1	2	3	4	5	6	7	8	9
2	Efficient	1	2	3	4	5	6	7	8	9
3	Systematic	1	2	3	4	5	6	7	8	9
4	Practical	1	2	3	4	5	6	7	8	9
5	Disorganized	1	2	3	4	5	6	7	8	9
6	Sloppy	1	2	3	4	5	6	7	8	9
7	Inefficient	1	2	3	4	5	6	7	8	9
8	Careless	1	2	3	4	5	6	7	8	9
9	Creative	1	2	3	4	5	6	7	8	9
10	Imaginative	1	2	3	4	5	6	7	8	9
11	Philosophical	1	2	3	4	5	6	7	8	9
12	Intellectual	1	2	3	4	5	6	7	8	9
13	Complex	1	2	3	4	5	6	7	8	9
14	Deep	1	2	3	4	5	6	7	8	9
15	Uncreative	1	2	3	4	5	6	7	8	9
16	Unintellectual	1	2	3	4	5	6	7	8	9

Appendix C
Demographic Sheet

Survey Number _____

About You

Please fill-in the appropriate information below.

General Information

Gender: ___ Female (1) ___ Male (2)

Ethnicity:
___ (1) African-American
___ (2) Asian-American
___ (3) Chicano/Latino
___ (4) Native American
___ (5) White
___ (6) Other _____

Age: _____

Education

Highest Level of Education Completed as of June 1996:
___ (1) Less than High School Diploma
___ (2) High School Diploma
___ (3) Some College
___ (4) College Graduate (Bachelor Degree)
___ (5) Some Graduate School
___ (6) Master Degree
___ (7) Doctoral Degree

Place a check on the line(s) of any courses you have had or workshops you have attended on:
___ Logic
___ Critical Thinking
___ Problem Solving
___ Decision Making
___ Conflict Resolution
___ Negotiating

Work Experience

Number of Years of Full-time Work Experience: _____

Have you ever had managerial experience? ___ Yes (1) ___ No (2)

Are you currently in a managerial position? ___ Yes (1) ___ No (2)

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